USDA United States Department of Agriculture

Soil Science Curriculum

January 2018

Soil Microbiology - "Tighty Whities" Test

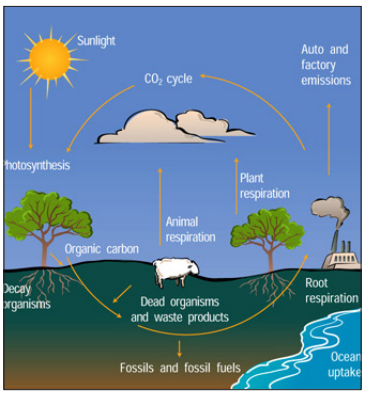
Approximately 135 minutes

Objectives

The "Tighty Whities" Test is a comparative test that shows the presence or absence of soil microbiology under different management techniques. This introduction information is compatible with the Soil Respiration lesson plan. For microbes to use energy and respire carbon dioxide (Soil Respiration lesson plan), they must uptake food. Food for these microorganisms is organic matter that comes from dead plant material. Since the cotton "tighty whities" are made from organic material (not including elastic), the soil microbiology will feed on them if microbes are present. The less "tighty whitie" material left, the more soil microbiological activity. The example on the bottom shows that high rotational diversity, no-till cropping systems have more material consumed than low diversity, tilled cropping system.

"Tighty Whities" Test

- Choose locations, field or garden, with different management techniques that you want to compare (ex. Long term no-till vs. conventional till).
- Bury "tighty whitie" in each field 2-inches deep, mark the location where you planted the whities.
- Dig out remains 6-8 weeks later.
- Visually compare remaining material.
- Compare weights of the "tighty whities."



Notes

- Works best during active growing season May through June and not as well in July through August.
- Can also compare different grassland management systems.

Example:

2017 SH school, tighty whities were buried for **three** weeks (during August) in a cover crop field that had been no till for seven years.

"Tighty Whitie" demonstration data set, 2016 Soil Health School, Aberdeen, SD

Brief Condition (Figure 1. order, left to right	Average Brief Weight (grams/bief) 5 replications
Control -non-buried	58.5 a
No-till soil with cover crops	28.4 c
Mulch (reduced) till soybeans	48.3 b
Conventional tilled corn	50.8 b
Stats:	
F	0.001
CV	7.7
LSD (.05)	4.9
*Brief averages with different lower case letters are significantly different.	